

## **REMARKS**

Claims 1, 16, and 18 are amended, and claims 24-25 are added herein. Claims 1-25 are pending in the captioned case. Further examination and reconsideration of the presently claimed application are respectfully requested.

### **Section 102 Rejection**

Claims 1-10, 12-14, and 16-23 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,330,008 to Razdow et al. (hereinafter “Razdow”). At the onset, Applicant calls attention to the Information Disclosure Statement filed contemporaneously herewith citing U.S. Patent No. 6,311,265 to Beckerle et al. (hereinafter “Beckerle”). Both Razdow and Beckerle are commonly assigned to Torrent Systems, Inc. and contain overlapping subject matter.

Razdow and Beckerle describe a method for describing a record-oriented dataflow process (as a single dataflow graph) in a design environment and for executing the dataflow process using both horizontal partitioning and pipeline parallelism. In both cases, the parallelism is at the operating system process level and requires the use of interprocess communications (IPC) mechanisms both to control and transfer data between processes.

In Razdow and Beckerle, the tools are used to generate the scores for dataflows with parallel operators. This is essentially a process of generating the dataflow graphs needed to effect the execution of the original dataflow graph on different computer processor (node) where each processor is responsible for processing a single horizontal partition of the input data. That is, Razdow and Beckerle executes the dataflow graph by partitioning the processes to separate computers on a network of computers, where each computer has its own operating system. I.e. the focus is on producing the score that makes it possible to run multiple instances of the same dataflow graph in parallel on multiple computer systems.

The present invention is concerned with transforming a hierarchical composition of dataflow graphs into a single flattened dataflow graph for execution on a single system. Here, the preferred embodiment uses a multithreaded parallelism for the execution of a single dataflow graph.

Razdow and Beckerle do not assign threads for each operator or process in the dataflow graph. Instead the same dataflow graph is executed on one or more computer processors in a network of computers. On each of these processors, the operators are forked as separate operating system (OS) level processes, requiring OS level interprocess communications (IPC) mechanisms for transferring data between operators.

Razdow and Beckerle disclose a system for visualizing and monitoring the execution of a dataflow application across multiple computers by generating an execution plan that partitions the work across multiple computers where each computer executes the same execution plan on a subset of the input data. The data is partitioned into subsets and allocated to a particular computer.

In contrast, the present invention envisions (in a preferred embodiment) each operator is executed on a thread in a single operating system process and the links use process local shared memory to transfer data between operators. The present invention generates an execution plan for a single system with one or more computer processors (CPUs or cores) where the execution plan executes in parallel as single OS process using threads. Additionally, the executor uses additional threads to monitor the execution of the dataflow application to detect and automate the handling of deadlocks.

Turning to the claims, independent claim 1 allows that the system might operate on a multi core computer having a single operating system, but not a network of computers such as contemplated by Razdow and Beckerle. The executor of claim 1 finds no counterpart in Razdow and Beckerle, and indeed calls for execution of the dataflow application in parallel with each map component at least as a separate thread. (Claim 1 allows for the possibility that several

threads could be assigned to several processes in a single map component). As noted above, Razdow and Beckerle do not assign processes or operators to threads.

Independent claim 16 has been amended to place a preferred method in the context of a parallel processing environment comprising a single operating system and one or more processors and to emphasize that “each map process is executed on its allocated thread substantially in parallel, and said data resides in memory accessible to each map process.” Razdow and Beckerle do not assign threads for each operator or process in the dataflow graph. Instead the same dataflow graph is executed on one or more computer processors in a network of computers.

Independent claim 18 has been amended to emphasize that a method hereof assigns a thread to each operator (map component) where the threads execute in parallel (substantially) without the data partitioning found in Razdow and Beckerle where the same dataflow graph is executed on one or more computer processors in a network of computers.

For at least the reasons stated above, Applicants assert independent claims 1, 16, and 18, as well as claims dependent therefrom, are patentable over the cited art. Accordingly, removal of this rejection is respectfully requested.

### **Section 103 Rejection**

Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Razdow in view of U.S. Patent No. 7,095,852 to Wack et al. (hereinafter “Wack”). Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Razdow in view of U.S. Patent No. 6,993,753 to Yamanaka (hereinafter “Yamanaka”).

For at least the same reasons discussed above regarding the patentability of independent 1, Applicants believe claims 11 and 15 dependent therefrom are also patentable over Razdow or the combination of Razdow and Wack, or the combination of Razdow and Yamanaka. Accordingly, removal of this rejection is respectfully requested.

## **CONCLUSION**

The present amendment and response is believed to be a complete response to the issues raised in the Office Action mailed September 10, 2007. In view of the amendments and remarks herein, Applicants assert that pending claims 1-25 are in condition for allowance. If the Examiner has any questions, comments, or suggestions, the undersigned attorney earnestly requests a telephone conference.

No fees are required for filing this amendment; however, the Commissioner is authorized to charge any additional fees which may be required, or credit any overpayment, to Daffer McDaniel, LLP Deposit Account No. 50-3268.

Respectfully submitted,

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